

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

| | | |
|--|--|--|
| Applicant's or agent's file reference PHDE040074WO | FOR FURTHER ACTION | See item 4 below |
| International application No. PCT/IB2005/050836 | International filing date (<i>day/month/year</i>) 07 March 2005 (07.03.2005) | Priority date (<i>day/month/year</i>) 15 March 2004 (15.03.2004) |
| International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237 | | |
| Applicant PHILIPS INTELLECTUAL PROPERTY & STANDARDS GMBH | | |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------------------|---|---|-----------|---------------------|--------------------------|------------|----------|--------------------------|-------------|--|--------------------------|------------|----------------------------|-------------------------------------|-----------|---|--------------------------|------------|-------------------------|--------------------------|-------------|--|-------------------------------------|--------------|---|
| 1. | This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 <i>bis</i> .1(a). | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. | This REPORT consists of a total of 9 sheets, including this cover sheet. In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead. | | | | | | | | | | | | | | | | | | | | | | | | |
| 3. | <p>This report contains indications relating to the following items:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 10%; text-align: center;"><input checked="" type="checkbox"/></td> <td style="width: 30%;">Box No. I</td> <td style="width: 60%;">Basis of the report</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table> | <input checked="" type="checkbox"/> | Box No. I | Basis of the report | <input type="checkbox"/> | Box No. II | Priority | <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability | <input type="checkbox"/> | Box No. IV | Lack of unity of invention | <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement | <input type="checkbox"/> | Box No. VI | Certain documents cited | <input type="checkbox"/> | Box No. VII | Certain defects in the international application | <input checked="" type="checkbox"/> | Box No. VIII | Certain observations on the international application |
| <input checked="" type="checkbox"/> | Box No. I | Basis of the report | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | Box No. II | Priority | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | Box No. IV | Lack of unity of invention | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | Box No. VI | Certain documents cited | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> | Box No. VIII | Certain observations on the international application | | | | | | | | | | | | | | | | | | | | | | | |
| 4. | The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2). | | | | | | | | | | | | | | | | | | | | | | | | |

| | | | |
|--|---|--|--|
| The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70 | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Date of issuance of this report 19 September 2006 (19.09.2006)</td> </tr> <tr> <td style="padding: 2px;">Authorized officer <div style="text-align: center; font-weight: bold; font-size: 1.2em;">Cecile Chatel</div> e-mail: pt13@wipo.int</td> </tr> </table> | Date of issuance of this report 19 September 2006 (19.09.2006) | Authorized officer <div style="text-align: center; font-weight: bold; font-size: 1.2em;">Cecile Chatel</div> e-mail: pt13@wipo.int |
| Date of issuance of this report 19 September 2006 (19.09.2006) | | | |
| Authorized officer <div style="text-align: center; font-weight: bold; font-size: 1.2em;">Cecile Chatel</div> e-mail: pt13@wipo.int | | | |

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY



29/9.

To:

see form PCT/ISA/220

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/B2005/050836

International filing date (day/month/year)
07.03.2005

Priority date (day/month/year)
15.03.2004

International Patent Classification (IPC) or both national classification and IPC
G06T15/00

Applicant
PHILIPS INTELLECTUAL PROPERTY & STANDARDS GMBH

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



European Patent Office - P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk - Pays Bas
Tel. +31 70 340 - 2040 Tx: 31 651 epo nl
Fax: +31 70 340 - 3016

Authorized Officer

Deltorn, J-M

Telephone No. +31 70 340-3468



**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/IB2005/050836

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
☐ a sequence listing
☐ table(s) related to the sequence listing
 - b. format of material:
☐ in written format
☐ in computer readable form
 - c. time of filing/furnishing:
☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/B2005/050836

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | |
|-------------------------------|-------------|-----------------|
| Novelty (N) | Yes: Claims | |
| | No: Claims | 1,4,6,10,12,14 |
| Inventive step (IS) | Yes: Claims | |
| | No: Claims | 2,3,5,7-9,11,13 |
| Industrial applicability (IA) | Yes: Claims | 1-14 |
| | No: Claims | |

2. Citations and explanations

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item V.

1. Reference is made to the following documents:

D1: OHSHIMA T ET AL: "Gaze-directed adaptive rendering for interacting with virtual space" VIRTUAL REALITY ANNUAL INTERNATIONAL SYMPOSIUM, 1996., PROCEEDINGS OF THE IEEE 1996 SANTA CLARA, CA, USA 30 MARCH-3 APRIL 1996, LOS ALAMITOS, CA, USA, IEEE COMPUT. SOC (1996-03-30), pages 103-110,267

D2: XINYUE LI ET AL: "Time-critical multiresolution volume rendering using 3D texture mapping hardware" PROCEEDINGS IEEE/ACM SIGGRAPH SYMPOSIUM ON VOLUME VISUALIZATION AND GRAPHICS 2002. BOSTON,MA, OCT. 28 - 29, 2002, NEW YORK, NY : IEEE, US (2002-10-28), pages 29-36

D3: WAN M. QU H., ZHANG N. AND KAUFMAN A. "Multi-resolution rendering of large scaled voxel-based terrain", retrieved from the internet (05-12-2003)

2. INDEPENDENT CLAIMS 1, 10, 12 AND 14

2.1 Claim 1

The lack of clarity discussed in box VIII below notwithstanding, the present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT.

Document D1 discloses (the references in parentheses applying to this document):

A method of interactively visualizing a three-dimensional data set of an object of interest (D1, section 1, section 4.2), wherein the method allows for an interactive input (page 104, left-column, lines 5-11), the method comprising the steps of: varying a rendering method in an image during the interactive input (section 4.1); wherein the

variation of the rendering method causes a non-uniform quality of the image (page 104, left-column, lines 5-11; section 2) ; and wherein the image is determined on the basis of the three-dimensional data set (D1, section 1, section 4.2).

2.2 Claims 10, 12 and 14

The subject-matter of claims 10, 12 and 14 correspond respectively in terms of device, system and program to the subject-matter of Claim 1. Claims 10, 12 and 14 are therefore, for the same reason as for Claim 1, considered as lacking novelty (Article 33(2) PCT).

3. DEPENDENT CLAIMS 2-9, 11, 13

Dependent claims 2-9, 11, 13 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty or inventive step (Article 33(2) and (3) PCT).

3.1 Claims 2 and 11

The additional feature of claims 2 and 11 correspond solely to an alternative between normal (full quality) rendering mode and the adaptive quality mode as presented in the method of Claim 1. Such an alternative comes within the scope of the customary practice followed by persons skilled in the art, especially as the advantages thus achieved can readily be foreseen. Consequently, the subject-matter of claims 2 and 11 lacks inventive step in the sense of Article 33(3) PCT.

3.2 Claims 3 and 5

The additional features of claims 3 and 5 are disclosed in document D2 (section 5.4) as providing the same advantages as in the present application. The skilled person would therefore regard it as a normal option to include this feature in the method described in document D1 in order to solve the problem of adapting the level of detail to specific regions of the rendered image. Claims 3 and 5, therefore, do not involve an inventive step in the sense of Article 33(3) PCT.

3.3 Claims 4 and 6

The features of claims 4 and 6 are also disclosed in document D1 (section 4.1). Said claims 4 and 6, therefore, also lack novelty in the sense of Article 33(2) PCT.

3.4 Claim 7

The lack of clarity discussed in box VIII below notwithstanding, the additional feature of claim 7 consisting in adjusting the rendering (i.e. the level of details) is adjusted as a function of the complexity (for instance, the local curvature) is disclosed in document D1 (section 4.2).

The further feature consisting of adjusting the rendering as a function of an "update speed as required by the user" is disclosed in document D2 (e.g. abstract; section 1: page 29, right-column, lines 6-10; section 4), wherein "frame time" is considered equivalent as said "update speed".

The availability of hardware resources to control the rendering mode (i.e. "to determinate Level-of-Details") is also disclosed in D2, section 2 (e.g. page 29, right-column, lines 36 - page 29, end of right-column), wherein "the difference between the desired and the actual rendering time from the previous frame" being an estimate of the availability of the computing power at hand for the rendering process.

Therefore, the skilled person would consider as a normal option to include these two features in the method described in document D1 in order to solve the problem of adapting the level of detail to specific regions of the rendered image. Claim 7, therefore, do not involve an inventive step in the sense of Article 33(3) PCT.

3.5 Claims 8 and 9

The additional features of claims 8 and 9 corresponding respectively to a method of rendering based on ray casting (claim 8) and wherein the sampling along a ray is varied (claim 9) are presented in document D3 (section 3.3) as providing the same advantages as in the present application. The skilled person would therefore regard it

as a normal option to include this feature in the method described in document D1 in order to solve the problem of adapting the level of detail to specific regions of the rendered image. Claims 8 and 9, therefore, do not involve an inventive step in the sense of Article 33(3) PCT.

3.6 Claim 13

The feature of Claim 13 wherein the system producing the three-dimensional data set is a CT or MR scanner corresponds to an obvious application that the skilled person would regard it as a normal option to include in the system corresponding to the method described in document D1 in order to solve the problem of optimizing the visualisation speed of large 3D datasets from CT or MR scanners. Claim 13, therefore, does not involve an inventive step in the sense of Article 33(3) PCT.

Re Item VIII.

1. CLAIMS 1, 10, 12 AND 14

- 1.1** The wording "non-uniform quality" used in claims 1, 10, 12 and 14 is vague and unclear and leaves the reader in doubt as to the meaning of the technical feature to which it refers, thereby rendering the definition of the subject-matter of said claims unclear, Article 6 PCT.
- 1.2** Furthermore, claims 1, 10, 12 and 14 do not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined. The wording "causes a non-uniform quality of the image" in said claims attempt indeed to define the subject-matter in terms of the result to be achieved, which merely amounts to a statement of the underlying problem, without providing the technical features necessary for achieving this result.

2. CLAIM 6

- 2.1** The wording "an automatism based on information acquired during rendering" used in claim 6 is vague and unclear and leaves the reader in doubt as to the meaning of the technical feature to which it refers, thereby rendering the definition of the subject-matter of said claim unclear, Article 6 PCT.